

# Cocatalysts for Metal-Catalyzed Olefin Polymerization: Activators, Activation Processes, and Structure–Activity Relationships

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## I. Introduction

One of the most exciting developments in the areas of catalysis, organometallic chemistry, and polymer science in recent years has been the intense exploration and commercialization of new polymerization technologies based on single-site and metallocene coordination olefin polymerization catalysts.<sup>1</sup> The vast number of specifically designed/synthesized transition metal complexes (catalyst precursors) and main-group organometallic compounds (cocatalysts) allows unprecedented control over polymer microstructure, the generation of new polymer architectures, and the development of new polymerization reactions. Commercialization of new generations of single-site and metallocene catalyst-based technologies has provided the multibillion pound per year polyolefins industry with the ability to deliver a wide range of new and innovative olefin-based polymers having improved properties.<sup>2–4</sup> The intense industrial activity in the field and the challenges to our basic understanding that have come to light have in turn

